Design Document

he-hu-ho-jo
Kelly He, Grace Hu, Kelly Ho, and Zach Johnson

Overview

Our system aims to provide a platform for users to easily plan to attend Cambridge City Council meetings, and for those meeting organizers to advertise their meetings for higher engagement. Currently, the only solution that exists is a website which lists all the meetings in an unaesthetic and unfriendly layout; users can't really tell what the meetings are about unless they open a separate PDF for each meeting. A calendar view would be a lot more user friendly to see what fits with their schedule. It's hard to navigate and hard to keep track of upcoming meetings; there are more barriers for users to attend meetings, contributing to low meeting engagement.

Therefore, we propose CommittedUnity, which is our system that will allow admin to advertise their meetings by tagging it with relevant topics or tags, and shows all of the information to users in a way that is more convenient to view and save to their profiles and Google calendar. Another feature is that users can earn points and badges for attending meetings. These points and badges are publicly seen on the application, and so meeting organizers can give rewards and recognition to those who are especially involved.

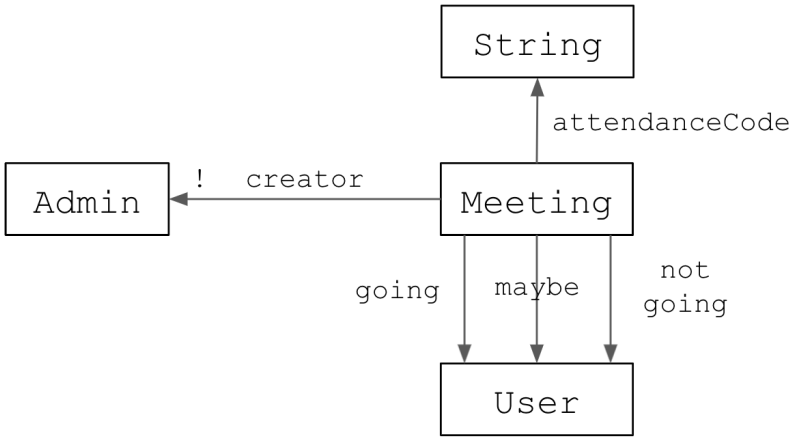
One key purpose is to **make meeting information conveniently available** - with a quick glance at tags, meeting time, and location, we want users to decide whether they are interested. We want to display information for each meeting clearly such that users can know whether they'll be able to or want to attend. With tag filters, users can also find specific meetings of interest and reduce the amount of time they have to spend looking through agendas and irrelevant meeting information.

Another key purpose is to **increase Cambridge City Council Meeting engagement** - we want more people to attend meetings by gamifying attendance through a point system. We want people to be aware of and attend meetings by removing any barriers (like not having a convenient place to find meeting information), and by incentivizing users by giving points for attendance. The points are meant as an extra push to get users to go to meetings, and we don't expect anyone to try to take advantage of the system because the rewards for getting points and badges are up to city council members, who we don't expect to give particularly lucrative prizes. We are anticipating an issue with this, because if there isn't enough incentive with a prize, the point system may not incentivize people as much as we think, but if there is a big prize, people may flood meetings without actual interest, which can cause chaos. However, we are envisioning encouraging the City Council Members to give something along the lines of a t-shirt, water bottle, or tote bag as prizes.

Conceptual Design

Name: Meeting

- *Purpose:* to gather members of the community to discuss topics relating to the city
- *State:*



going, maybe, not going have no intersections (for each meeting, a user is either going, maybe, or not going (or none))

  -
- *Actions:*
  - `addGoing(id: Int, u: User):`
    ```
    let meeting = Meetings.locate(id);
    meeting.going.add(u);
    ```
  - `addMaybe(id: Int, u: User):`
    ```
    let meeting = Meetings.locate(id);
    meeting.maybe.add(u);
    ```
  - `addNotGoing(id: Int, u: User):`
    ```
    let meeting = Meetings.locate(id);
    meeting.notGoing.add(u);
    ```
  - `verifyAttendance(id: Int, u:User, attendanceCodeInput:String):`
    ```
    let meeting = Meetings.locate(id);
    if (attendanceCodeInput === meeting.attendanceCode && time.now() is during meeting.time) {
        meeting.attendance += u;
        return true
    }
    return false
    ```
- *Operational Principle:*

    - All u: User | if `(addGoing(id, u) or addMaybe(id, u)) and not addNotGoing(id, u)`, then corresponding meeting will appear in user's 'Upcoming Meetings' feed
- *Comments:*
    - Each user can mark themselves as going, maybe, or not going, but this is separate from the actual attendance at the meeting. It is moreso an indication or RSVP so that admins know how many people to expect.
    - The actual attendance is tracked by the user inputting a meeting-specific code, given by an admin at a meeting.

Name: Admin Privilege

- *Purpose:* provide authorization access to manage meetings
- *State:*

    -
- *Actions:*
    - `createMeeting(name: String, host: Admin, time: Nat, location: String, agenda: String, tags: List(String)):`

```
m = new Meeting;
m.name = name;
m.time = time;
m.location = location;
m.agenda = agenda;
m.tags = tags;
m.host = host;
m.id = count; //count will be a unique global integer
m.attendees = [ ];
m.going = [ ];
m.maybe = [ ];
m.notGoing = [ ];
m.attendanceCode = String
DB.add(m);
```

    - `deleteMeeting(id: Int, host: Admin):`

```
let meeting = Meetings.locate(id);
if (host.name===meeting.host) {
    DB.remove(meeting);
}
```

    - `editMeeting(id: Int, host: Admin, newValue: *new value type for respective field*, field: String):`

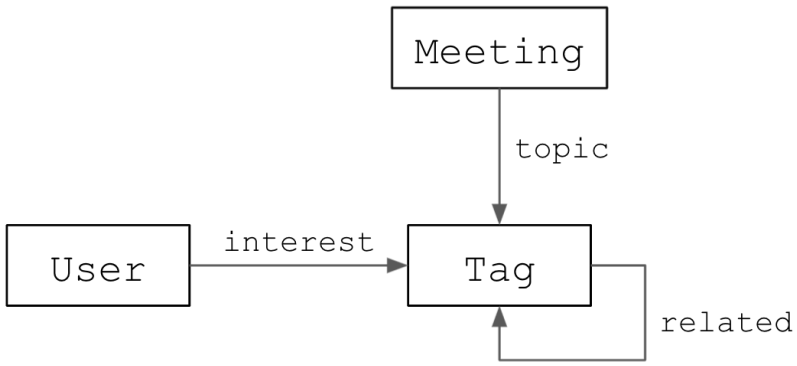
```
let meeting = Meetings.locate(id);
```

```
if (host.name === meeting.host) {
   meeting.{field} = newValue;
}
```

- *Operational Principle:*
  - if admin a creates meeting m, then m will appear in user u's "all meeting" feed
- *Comments:*
  - An admin specifies all the information and tags for their meetings, and they are in charge of distributing the meeting attendance code during a meeting

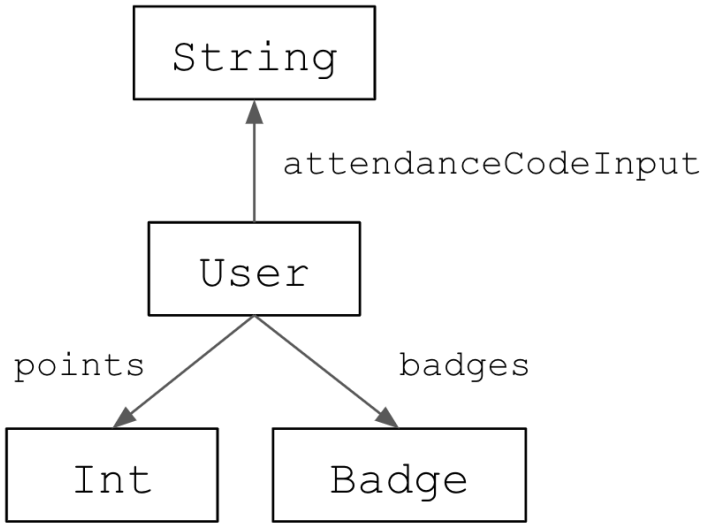
Name: Recommend Topics

- *Purpose:* More easily discover meetings of probable interest
- *State:*



  -
- *Actions:*
  - `likeTopic(t:Tag, u:User):`
    `u.interest += t`
  - `unlikeTopic(t:Tag, u:User):`
    `u.interest -= t`
  - `getRecommendedTags(t:Tag, u:User):`
    `u.interest`
- *Operational Principle:*
  - for user u, if u likes tag t, then t's related set of tags R will be recommended to u as a suggested topic.
  - if u likes tag r in R, then meetings with tags including r will be included in the user's meetings with probable interests.
- *Comments:*
  - For the MVP, the recommending system will be implemented using hard-coded tags table lookup, where meetings with tags similar to ones user likes will appear here
  - We aim to have Dynamic topic recommendation, where users with similar interests get recommended similar tags to follow for the final product

Name: Incentive System

- *Purpose:* introduce game mechanics to web app to to increase user participation
- *State:*
  - 

- *Actions:*
  - `inputAttendanceCode(id:Int, attendanceCodeInput:String) {`
    `let meeting = Meetings.locate(id);`
    `meeting.verifyAttendance(u, attendanceCodeInput)`
    `}`
  - `givePoints(u: User, p: Point)`
    `u.points += p`
  - `giveBadge(u: User, t: Threshold, b: Badge)`
    `if u.points > t`
    `User.badges += b`
- *Operational Principle:*
  - if user `inputAttendanceCode(id, attendanceCodeInput)=== true`, user earns a point for attending that meeting
  - if user is awarded points beyond a threshold, user is given a badge

Wireframes

Order of operations for *user* account:

1) Create Account → User → Next → Next → Go To CommittedUnity → View Agenda (of either meeting) → Exit out of agenda→ select and/or edit whether going/maybe/not going → go to recommended meetings tab → select going/maybe → go to upcoming meetings tab → go to profile → hit '+' to add new tag → add tag → edit account → update → delete account

2) Sign in → sign in → go to CommittedUnity → same as #1

See slide 32 to see a change in rank (not able to show this with clicking)

Order of operations for *admin* account:

1) Create Account → Admin → Next → Next → Go To CommittedUnity → View Agenda → exit out of agenda → Create → Create → View Agenda → Exit out of agenda → Edit Meeting → Update → Your Meetings tab → Delete Meeting → Profile → Edit Account → Update → Delete Account

LINK TO WIREFRAME SLIDES:
https://docs.google.com/presentation/d/1gioUkDQce1RfOquYL3t65x8mTerdiaDqCUe6YnmImVc/edit?usp=sharing

LINK TO WIREFRAME VIDEO DEMONSTRATION:
https://drive.google.com/file/d/1x5_qB6BuMAHazqOAEDqQNmGGLd2MgUjt/view?usp=sharing

Note: As I was deleting the City of Cambridge account, it displayed the old name, "Cambridge City Council." This should have read City of Cambridge, since I updated the account's name, but this was difficult to implement with slides. Additionally, when John Smith adds a tag, that new tag will appear in the tags on his profile (but since the tags look the same in the wireframe I did not explicitly show this). Lastly, I 'deleted' John Smith's account and then showed myself signing in to this same account afterwards. In the actual app, this would not happen, but rather an error message reading something like "That account does not exist" would appear. This only occurred in the wireframe because I went out of order on the operations, but if you follow the operations listed above, this will not occur.

Design Commentary

Topic Recommendation Algorithm

Every meeting is tagged with topics that they are related to. Users can follow these tags, and thus get information about when these meetings with specific tags occur. We decided to find users with similar interests and recommend their other interests.

Design #1: Randomized Recommendations

Topics are randomly recommended to users and users respond if they are interested.

Design #2: Mapping of Related Interests

Hardcoded map where nodes are interests and are connected with an edge if they are related. Topics that are similar based on the map will be recommended.

Design #3: Similar User Interests

Users will be recommended the interests of users with three or more similar interests.

Criteria	Design #1: Randomized Recommendations	Design #2: Mapping of Related Interests	Design #3: Similar User Interests ***(chosen design)***
Quality of recommendations (likeliness to be a successful recommendation)	**Bad** Recs aren't personalized for each individual	**Neutral** Users have individual recs, but the recs may be limited	**Good** Each user's recs are related to another person
Exposure to and awareness of tags (what percentage of the total tabs will the user be exposed to / aware of?)	**Good** This would be to just have users constantly exposed to all the different tags so that they don't miss anything they are interested in.	**Neutral** Users will only be exposed to related topics from a preset mapping, so they must explore the new tabs themselves to be exposed to different categories. However, it could be possible to design the preset mapping in such a way that it's more likely for users to see all possible tags having originally liked a few tags.	**Neutral** Depending on how varied other users are or how big the user base is, there would be better exposure than just the mapping. However, it could be worse than design #2 if one particular tag is very popular, but very few people like another tag.

Gamification

Users are awarded points, which translates to “prizes”, for demonstrating engagement by attending meetings. This application of a game-like system intends to enhance overall user engagement with our system and their community by leaning into the innate competitive nature of humans as well as the attractiveness of decals and distinction from other users. The prize here will be a badge associated with a user’s display name.

Designs Considered

Design #1: Badge with display name

All users will start off with having no badge. Once a user reaches certain thresholds, they will earn a badge that will appear with the user’s display name. The badges rewarded with more points are generally regarded as more desired badges. The badges and engagement points will reset after every predefined period of time to encourage users to continuously engage.

Design #2: Leadership board

A user can indicate a network of other user(s) who they choose to share their total engagement point count by. This peer-to-peer comparison will display the ranking of how the user compares to their friends/network.

Design #3: Global Feed

There will be a global public feed of all user’s engagement actions (earning points from attending meetings, receiving a certain badge level, etc).

Design Evaluation Summary

Criteria	Design #1: **Badge with display name** ***(chosen design)***	Design #2: **Leadership board**	Design #3: **Global feed**
Likeliness to incentivize users (will it actually increase attendance?)	**Medium/High** Users will be motivated to have an icon tied to their display name that distinguishes them from other users. However, users may stop engaging once they reach a certain engagement level - we can address this by having badges reset after a certain period of time.	**High** Having a comparison between a user’s chosen peers can lead to more competitiveness because people tend to be more emotionally invested when comparing themselves to people they know personally vs strangers. This would require the user to have other friends also using the app.	**Medium** From seeing a constant stream of how other members of one’s community are engaging, this will remind and nudge a user to also get on the feed.

User Privacy	**Good** Badges do not contain easily identifiable information, but could draw more attention to a user if they do have a badge.	**Ok/Bad** Users who are on the leaderboard don't get to choose whether they want to be displayed, but they have control over who their friends are which affects who can see their score.	**Bad** Users do not get an option to not be broadcasted in the feed.

Rewards for Points and Badges

To incentivize users to use the app with a points and badges system. For our app, we want to have the city be responsible for the prize system. That way, they can decide which awards correspond to different amounts of points and types of badges.

Designs Considered

Design #1: CommittedUnity supplies a prize

The app supplies a prize and delivery logistics.

Design #2: City Council Admins supply a prize

City council makes their own prize awarding and delivery logistics.

Design #3: Partnerships with local shops to redeem a small gift

Connect with local shops who are willing to give rewards for being involved in local council meetings. If a user has a certain badge, they get a discount or a free item, or something similar depending on the store.

Design Evaluation Summary

Criteria	Design #1: **CommittedUnity supplies a prize**	Design #2: **Cambridge City Council Admins supply a prize** ***(chosen design)***	Design #3: **Partnerships with shops to redeem a small gift**
Feasibility (logistics, distribution)	**Bad** If the prize was a physical / monetary prize, not just a badge or status, as the company designing this application for no profit, the funding is	**Neutral** Distribution is very feasible because users would be able to pick up their prize at meetings. However, the hard part would be getting the council to agree to fund a	**Neutral** Users would be the ones to go to the shops, so as long as they go, distribution is feasible. However, it could be difficult to get shops to agree because it would

	not feasible and distribution would be difficult with shipping.	prize. We think it's feasible though because they want more people to be engaged.	cost them money. We think it could work potentially because people want people to get involved with their local governments.
Likeliness to work as an incentive (is it something people want?)	Neutral If the prize were a physical / monetary prize, it would likely be small because of the lack of funding. However, if the prize were in the app itself, such as the badge, it's less likely to work as an incentive because there's no real monetary value of the badge, though we think collecting points and badges can definitely be rewarding, similar to a video game.	Neutral The prizes that we were thinking that admins would supply are something like t-shirts and water bottles, possibly branded with a related logo. These are likely stuff that people would want; funding is probably not that plentiful so the prizes could also not be very attractive, depending on what the admins actually choose.	Good Users usually like rewards from shops for free items and/or discounts. It does depend on the shop, but on average, people will probably love free stuff.
Avoid Unintended Consequences & Ethical Concerns	Good We are assuming that the points system wouldn't be taken advantage of because points have no real value, but if there were to be a problem with people trying to take advantage of the system, it would be harder for us to adjust to combat the effects because we have 1 degree of separation from the meeting attendees. However, it is likely we won't have abusers of our prize, whatever that may be, because it would have	Good If there are people who start coming just to get attendance points or trying to take advantage of the system, the council is able to quickly adjust because they are the ones getting direct feedback about the state of the incentive system. If the incentive is working "too well", they can reduce the prize and vice versa.	Bad Because these types of rewards are probably more sought after, it's likely that users could try to take advantage of the system by faking their attendance. If this were to happen, it would also be harder to adjust because the shops are another degree of separation apart from the issues, and so we would need direct communication with the shop to tell us what's happening.

	lower monetary value/incentive.		

Tracking Engagement

Users are rewarded points for showing engagement with community meetings, which we defined as attending meetings.To track a user's engagement, we chose to pursue the design choice Meeting Code, which involves users inputting a code that the host distributes during a meeting.

Designs Considered

Design #1: Honor System

Users will self-report which meetings they attended.

Design #2: Host Manually Tracks

Host of meetings will have the responsibility of tracking who attended a meeting. Our app would streamline this process by generating a list of users who marked going/maybe to a meeting, as well as provide the option to add other users to account for those who did not respond to a meeting but attended.

Design #3: Meeting Code

Upon creation of a meeting, each meeting will have an attendance meeting code for the host to inform attendees of during the meeting. If any user inputs the correct code, they will be counted as having attended the meeting. The Host will have to remember to distribute the code during the meeting.

Design Evaluation Summary

Criteria	Design #1: **Honor System**	Design #2: **Host Manually Tracks**	Design #3: **Meeting Code** *(chosen design)*
Effectiveness of measuring engagement	**Bad** Users can be untruthful and easily claim they attended meetings	**Good** Hosts will verify who attend	**Neutral** Users can share code with other users, but we believe this extra step won't happen given that the rewards for gaining points aren't expected to be lucrative.
Total effort	**Good**	**Bad**	**Good**

required for host	No additional effort needed from host	Host would have to remember all attendees and their names, as well as manually input in system	Meeting code is automatically generated, so minimal additional effort required from host

Ethics Protocol

Design Choice	**Values promoted (and for whom?)**	**Values demoted (and for whom?)**
Users achieve gold/silver/bronze status if they attend a certain amount of meetings.	**Structure Lens:** Users have an incentive to attend more meetings in their local community, which ideally in turn increases community engagement. **Process Lens:** Marking a user's profile with a specific color increases transparency and lets a user know exactly what their 'rank' is. This avoids any confusion over what rank a user has.	**Outcome Lens:** Users whose personal values and interests do not exactly line up with those of their local municipality are disadvantaged, because there are likely less meetings of interest to that user and thus it is difficult for them to earn points and achieve a certain rank. In this sense, the gamification system has the potential to be exclusionary, however municipality-wide meetings tend to address non-partisan issues like transportation, parks, infrastructure, education, etc.
Only certified administrators can create city-wide meetings.	**Structure Lens: This p**romotes the credibility and security of meetings; users can trust that the meetings they are viewing are legitimate and are not fake meetings hosted by some bad actor who may have malicious intent. **Process Lens: This p**revents bad actors from creating fake gatherings or spreading false agendas. Users do not need to scan through meetings to determine whether or not they are legitimate.	**Outcome Lens: T**here is a higher barrier to entry that excludes many individuals who may be trying to mobilize a group of people or spread awareness on a topic. For example, if an individual is trying to host a meeting to bring awareness to a specific issue within their neighborhood, they would have a very difficult time using our app to promote their meeting since they are not affiliated with an official organization or administration. They may need to take extra steps in order to prove that they are authentic and are not a bad actor, whereas a certified organization would not need to do so.

Users are recommended meetings that contain one of their chosen tags of interest.	**Structure Lens:** This increases civic engagement by offering users meetings that will actually be of interest to them, rather than a long list they need to scroll through to locate meetings of interest, which deters many users from seeking out city meetings at all. This is one key reason why turnout at city meetings is historically low, and our app resolves this. **Process Lens: In terms of the app itself, this p**romotes accessibility and navigability — users are now sorting through a refined list of meetings that pertain to their interests, rather than all upcoming meetings (which can be a very long list depending on the size of the city), and they can read the tags to easily determine what general topics the meeting will cover.	**Outcome Lens: T**his has the possibility of creating an echo chamber in the downstream. If users are only searching through meetings that match their interests, they may be neglecting other highly important meetings solely because it does not align with their values or political beliefs. This has the potential to promote political polarization, since our app encourages users to seek out meetings that pertain to their unique interests, rather than shopping around all meetings and trying to keep an open mind. Again, it is less likely that city-wide meetings are addressing highly-polarizing topics, but our app has the potential to promote this behavior in some situations.